

REMARKS/ARGUMENTS

Claims 1-36 are pending in the present application. Claims 8, 20 and 32 were canceled. Claims 1-5, 11, 13, 23, 25 and 35 were amended. Reconsideration of the claims is respectfully requested.

I. Objection to Claims

The Examiner objected to Claims 1, 8, 11, 13, 20, 23, 25, 32 and 35 for containing various informalities. Claims 8, 20 and 32 have been canceled, and the remainder of these claims have respectively been amended to overcome the objections.

II. 35 U.S.C. § 101

The Examiner has rejected Claims 25-34 under 35 U.S.C. § 101 as being directed toward non-statutory subject matter. Applicants have amended independent Claim 25 to overcome this rejection, by reciting the computer program product thereof to be executable in a computer readable storage medium.

III. 35 U.S.C. § 103, Obviousness

The Examiner has rejected Claims 1- 20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. Appl. Pub. No. 2004/0064428, to Larkin et al. (hereinafter "*Larkin*"), in view U.S. Pat. Appl. Pub. No. 2004/0122926 to Moore (hereinafter "*Moore*"). This rejection is respectfully traversed.

IV. Teachings of Applicants

In making their invention, the Applicants sought to enable dynamic selection of Web services, through the use of a mechanism comprising a single autonomic proxy. In embodiments of the invention, selection of a Web service may be based on non-technical attributes of a service, such as business criteria, as well as technical characteristics thereof. In an embodiment, after locating multiple Web service candidates, an autonomic proxy selects one of the services to invoke, and sends a message to the selected service, to determine whether it is available. If the selected service is not available, the autonomic proxy discovers the business policy of each of the remaining Web service candidates, and selects one of them. The autonomic proxy may also measure the response times of each Web service, by sending messages to each of the Web service candidates. The autonomic proxy then dynamically selects the Web service that is responding the quickest, according to its policy.

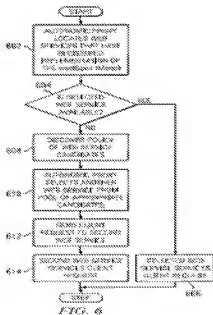
These teachings are disclosed in Applicants' specification, such as at page 5, lines 3-12; page 19, line 25 – page 20, line 12; page 20, line 23 – page 21, line 5; and Figure 6. These teachings are as follows:

The present invention provides a method and system for dynamically selecting functionally equivalent web services through a single autonomic proxy. The present invention addresses quality of service issues common in the Web service environment, such as failover, redundancy, performance, and security. The present invention may also apply policies based upon non-technical attributes of a service, e.g. business criteria. Such business criteria may be a preferred vendor or business partner or the cost of the service. [page 5, lines 3-12]

When the autonomic proxy locates one or more Web services that have registered an implementation of the wsdlSpec tModel (step 602), before utilizing this selected Web service to service the client request, autonomic proxy sends a message to the Web service to determine if the selected Web service is available (i.e., the network link to the selected candidate is available) (step 604). If the selected Web service is available, the selected Web service may service the client request (step 606), the process terminating thereafter.

Turning back to step 604, if the autonomic proxy determines that the selected Web service is no longer available, the autonomic proxy may discover the policy of each Web service candidate in the group of Web service candidates (step 608), and select another Web service from the pool of appropriate candidates based on the policy (step 610). The autonomic proxy sends the client request to the newly selected Web service (step 612). [page 19, line 25 – page 20, line 12]

When the autonomic proxy locates one or more Web services that have registered an implementation of the wsdlSpec tModel (step 702), before utilizing this selected Web service to service the client request, autonomic proxy may measure the response times of each Web service by sending messages to each of the Web service candidates (step 704). The autonomic proxy may analyze the responses received and discover the policy of each Web service candidate in the group of Web service candidates (step 706). The autonomic proxy may then dynamically select the Web service that is responding the quickest according to the policy (step 708). [page 20, line 23 – page 21, line 5]



V. Rejection of Claim 1

Claim 1 has been amended in part by placing limitations of original Claim 8, now canceled, into Claim 1. Claim 1 now reads as follows:

1. A method for dynamically selecting functionally equivalent Web services through a single autonomic proxy, comprising:
 - receiving a client request to locate a Web service at the single autonomic proxy;
 - querying a policy discovery mechanism based on the client request;
 - using the autonomic proxy to locate multiple Web service candidates to serve the client request, wherein each Web service candidate is functionally equivalent to the other Web service candidates, and said Web service candidates collectively comprise a group;
 - using the single autonomic proxy to select a first Web service to invoke from the group of Web service candidates, wherein the selection is based on the business policy of the first Web service;
 - sending a message to the first Web service from the autonomic proxy to determine if the first Web service is available;
 - in response to a determination by the autonomic proxy that the first Web service is not available, operating the dynamic proxy to discover the business policy of each of the other service candidate in the group of Web service candidates;
 - in response to a determination that the first Web service is not available, operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates based on the business policy; and
 - sending a request to the second Web service to serve the client request.

In rejecting Claim 8, the Examiner stated the following:

Regarding Claims 8, 20 and 32, Larkin teaches as follows:

Selecting candidate services (step 220 in figure 2) and invoking (equivalent to sending a message) candidate services (step 230 in figure 2)(see, e.g., page 3, paragraphs [0042] and [0043] respectively).

Moore teaches as follows:

A system and method for automating the selection of a web service based on reputation information (interpreted as applicant's business policy)(see, e.g., page 1, paragraph [0008]); and

selecting a Web service (selected resource 306 in figure 3) from a group of Web service candidates (list of corresponding resources 304 in figure 3)(selection mechanism 302 in figure 3 selects a resource from a list and narrow the list to a selected resource based on reputation data 308, see, e.g., page 4, paragraph [0034]).

It would have been obvious for one of ordinary skill in the art at the time of the invention to combine Larkin to include determining a web service among multiple available Web services based on reputation information as taught by Moore in order to effectively select a web service corresponding to the client's exact requirements.

It would have been also obvious for one of ordinary skill in the art at the time of the invention to modify Larkin and Moore to include looping process among multiple Web service candidates in order to select a Web service provider

which is actually available in real-time when the decision is made based on the reputation information. [Office Action dated 02/21/08, pps. 7-8]

In order to establish a *prima facie* case of obviousness under 35 U.S.C. § 103, *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966) requires determining, respectively, the scope and content of the prior art, the differences between the prior art and the claims at issue, and the level of ordinary skill in the pertinent art. Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning, to support the legal conclusion of obviousness. *KSR Int'l. Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. Apr. 30, 2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Canada Fed. 2006)). Additionally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). The suggestion to make the claim combination must be found in the prior art, not in the Applicants' disclosure. *In re Vaek*, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Moreover, in accordance with MPEP § 2142.02, each prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303 (Fed. Cir. 1993). A third essential requirement for establishing a *prima facie* case, set forth in MPEP § 2143.01, is that the proposed modification cannot render the prior art unsatisfactory for its intended purpose.

In the present case, not all of the features of the claimed invention have been properly considered, and the teachings of the references do not teach or suggest the claimed subject matter to a person of ordinary skill in the art. For example, no combination of *Larkin* and *Moore* teaches or suggests, in the over-all combination of Claim 1, any of the following features:

(1) Using the single autonomic proxy to select a first Web service to invoke from the group of Web service candidates, wherein the selection is based on the business policy of the first Web service (hereinafter "Feature (1)").

(2) Sending a message to the first Web service from the autonomic proxy to determine if the first Web service is available (hereinafter "Feature (2)").

(3) In response to a determination that the first Web service is not available, operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates based on the business policy (hereinafter "Feature (3)").

VI. Claim 1 Distinguishes over the Cited References

Feature (1) of Applicants' Claim 1 is directed to using a single autonomic proxy to select a first Web service to invoke, wherein the first Web service is selected from a group of Web service candidates, and selection is based on the business policy of the first Web service. This feature of Claim 1 is taught in Applicants' specification, such as at page 5, lines 13-16 and page 18, line 24 – page 19, line 5. Feature (1) thus emphasizes use of a single mechanism to dynamically tune the Web service environment, to thereby enable the single mechanism to determine which Web service, from multiple equivalent Web services, should be invoked in response to a client's request.

In the Office Action, only teachings of *Moore* were cited in regard to the Claim 8 step of selecting a Web service from a group of Web service candidates. The particular teachings of *Moore* were at paragraph [0034] thereof, and at items 304, 306 and 308. Paragraph [0034] of *Moore* and related paragraph [0036] thereof are as follows:

[0034] As generally represented in FIG. 3, one aspect of the present invention is directed towards selection of a resource (from among a plurality of available resources that otherwise match a client's needs) based on the resource's reputation. To this end, a selection mechanism 302 selects a resource from a list 304 (or other suitably arranged data) and narrows the list to a selected resource 306 based on reputation data 308. The list may be maintained by a listing mechanism 310 that is internal or external to a computer requesting selection, and the reputation data is provided by an internal or external auditor 312. Note that some or all of the components of FIG. 3, including the selection mechanism 302, may execute in the computer system 202 of FIG. 2, may execute external to it, or be distributed among internal and external components, and the selected resource 306 may be one of the resources shown in FIG. 2, e.g., the disk driver/disk 210, 212, the external hardware or software resource 206, the application 200, or some other resource. For example, as described below, part of a set of web services may be narrowed into a subset of web services by a selection mechanism component in a search engine, and that subset narrowed to one web service by a selection mechanism in a client. (emphasis added)

[0036] In accordance with an aspect of the present invention and described below, from the set determined by matching the client's contract requirements with a web service's contract offerings, the client ultimately chooses one web service to use based on reputation data. In other words, highly-detailed contract matches on specific web service interface definitions allow for global searches of web service providers. When, as is typical, the search results comprise more than one such resource that matches the specified contract requirements, the client needs to select one from the search results. The present invention provides a system and method for selecting a resource by filtering and/or ranking the search results via reputation data. (emphasis added)

As described above, the entire teachings of a prior art reference must be considered, in order to establish a *prima facie* case of obviousness under 35 U.S.C. § 103. At paragraph [0034], *Moore* clearly teaches the use of two different selection mechanisms, in order to select a Web service for a client. More specifically, *Moore* teaches that a set of Web services is narrowed into a subset of Web services, by a selection mechanism component in the search engine. Then, a second selection mechanism, located in the

client, is used to narrow the subset down to one Web service for the client. The *Moore* teaching of ultimate selection by the client is emphasized at paragraph [0036] thereof. In view of this disclosure, it is considered that *Moore*, as exemplified by paragraph [0034] thereof, clearly teaches away from use of a single autonomic proxy, to select a Web service from a group of Web service candidates, as recited by Feature (1) of Claim 1. By contrast, the over-all teachings of paragraph [0034] of *Moore* explicitly require use of two selection mechanisms, in order to achieve the intended results.

Teachings of *Larkin*, either alone or in any combination with *Moore*, do not overcome the above deficiencies of *Moore* in regard to Feature (1).

Claim 1 is considered to distinguish further over the cited references in reciting Feature (2) thereof, that is, sending a message to the Web Service from the autonomic proxy to determine if the first Web service is available. This is taught by Applicants' specification, such as at page 19, line 25 – page 20, line 4, and item 604 of Figure 6. However, this teaching is neither disclosed nor suggested by either of the references. For example, Figure 2 of *Larkin* discloses a step 230, of invoking candidate services. However, paragraph [0043] of *Larkin*, which refers to this step, discusses related protocols, and also states that step 230 invokes, "or sends messages to cause invocation of" the selected services.

This teaching of *Larkin* nowhere discloses or suggests sending a message to a service, as recited by Applicants' Feature (2), to determine if the service is available. Rather, *Larkin* at paragraph [0043] clearly assumes that the service is already available for invocation. Thus, *Larkin* by implication clearly teaches that sending a message, as recited by Feature (2), would be completely unnecessary. Moreover, neither of the cited references discloses sending a message to a service from an autonomic proxy, in order to determine service availability, as is further recited by Feature (2) of Claim 1.

Feature (3) distinguishes over the art by reciting, in the over-all combination of Claim 1, that in response to a determination that the first Web service is not available, operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates, based on the business policy. This feature was neither disclosed nor suggested by either reference. Also, neither reference discloses or suggests any need for the recitation of Feature (3). To the contrary, the prior art, as exemplified by paragraph [0034] of *Moore*, is considered to teach away from Applicants' Feature (3). For example, as described above, *Moore* at paragraph [0034] teaches that a client is provided with a subset of services, and makes a selection therefrom. Thus, if a first service proved to be unavailable, it would not be necessary, in the arrangement of *Moore*, to have an autonomic proxy select a second Web service, as is required by Feature (3) of Claim 1.

VII. No Basis for Combining References

The Office Action failed to state a *prima facie* obviousness rejection against Claim 1, because the Office Action did not state a proper reason to combine the *Larkin* and *Moore* references. As discussed above, *KSR Int'l Co. v. Teleflex, Inc.*, supra, requires that there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. In this case, the Office Action has provided no such articulated reasoning. Instead, the Office Action has asserted only a purported advantage to combining the references, which is not taught by the references. However, the Office Action has not provided any reasoning to show how the prior purported advantage supports the legal conclusion of obviousness, under the standards of *KSR, Int'l*. Applicants consider that it is particularly important to comply with such requirements in this case, where the references teach away from essential elements of the proposed combination, as discussed above.

VIII. Claims 2-7 and 9-12 Distinguish over the Cited References

Claims 2-7 and 9-12 respectively depend from Claim 1, and are each considered to distinguish over the art for at least the reasons given in support thereof.

Claim 2 is additionally considered to distinguish over the art in reciting that the autonomic proxy is disposed to measure response times at each Web service, by sending messages to each of the Web service candidates. Neither of the cited references, or any combination thereof, discloses this feature.

Claim 3 is additionally considered to distinguish over the art in reciting that the autonomic proxy dynamically selects the Web service that is responding most quickly, according to its business policy, to be the first Web service. Neither of the cited references, or any combination thereof, discloses this feature.

IX. Remaining Claims Distinguish over the Cited References

Claims 13 and 25 are independent claims that each incorporates patentable subject matter of Claim 1, and are each considered to distinguish over the art for at least the reasons given in support thereof.

Claims 14-19 and 21-24 respectively depend from Claim 11, and are each considered to patentably distinguish over the art for at least the reasons given in support thereof.

Claims 26-31 and 33-35 respectively depend from Claim 25, and are each considered to patentably distinguish over the art for at least the reasons given in support thereof.

X. Conclusion

It is respectfully urged that the subject application is patentable over the cited references and is now in condition for allowance.

The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

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Respectfully submitted,

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